



Standard Terminology Relating to Frozen Soil and Rock¹

This standard is issued under the fixed designation D7099; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This terminology includes all of those terms which relate to frozen soils and rocks.

1.2 It is based on: a list of definitions drawn up by ASTM Sub-Committee D18.19; ASTM standards; a list of definitions drawn up by the Canadian Geomorphology Research Group (CGRG); the Glossary of Permafrost and Related Ground-Ice Terms developed by the National Snow and Ice Data Center (NSIDC), at the University of Colorado, at Boulder; the Keys to Soil Taxonomy of the United States Department of Agriculture (USDA); and contributions by a number of individuals.

1.3 For all of the terms included, the source is included in parentheses after the definition.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D4083 Practice for Description of Frozen Soils (Visual-Manual Procedure)

2.2 Other References:

Harris, S. A., French, H. M., Heginbottom, J. A., Johnston, G. H., Ladanyi, B., Sego, D. C., and van Everdingen, R. O., 1988, Glossary of Permafrost and Related Ground-Ice Terms, Technical Memorandum, Associate Committee on Geotechnical Research, Ottawa, Canada

Everdingen, Robert van, ed., 1998, revised January, 2002, Multi-Language Glossary of Permafrost and Re-

lated Ground-Ice Terms, National Snow and Ice Data Center/World Data Center for Glaciology, Boulder, Colorado

National Snow and Ice Data Center, 2003, English Language Glossary of Permafrost and Related Ground-Ice Terms, Boulder, Colorado, <http://nsdic.org/fgdc/glossary/english.html>

Natural Resources Conservation Service, United States Department of Agriculture, Keys to Soil Taxonomy, Ninth Edition, 2003, 331 pp., http://soils.usda.gov/technical/classification/tax_keys

Permafrost Map of the USSR (1:2,500,000), 1996, Department of Geocryology, Moscow State University, 16 sheets

3. Significance and Use

3.1 This terminology can be used to find the definitions of all of those terms which are used in association with frozen materials, including rocks, soils, and water.

4. Terminology

4.1 Definitions:

4.1.1 All of the definitions are consistent with those listed in Terminology D653.

active layer—the top layer of ground that is subject to annual freezing and thawing. (In the zone of discontinuous permafrost, the active layer is often underlain by unfrozen ground.)

active layer failure—any of several possible forms of slope failure in the active layer. **NSIDC**

active layer thickness—the thickness of the top layer of ground that is subject to annual freezing and thawing. **NSIDC**

active rock glacier—a mass of rock fragments and finer material, on a slope, that contains an ice core or interstitial ice, and which shows evidence of recent movement. **NSIDC**

adfreeze shear strength—the shear stress required to separate two objects that are bonded together by ice.

adfreeze tensile strength—the tensile stress required to separate two objects that are bonded together by ice. **NSIDC**

adfreezing—the process by which objects are bonded together by the ice formed between them. **NSIDC**

¹ This terminology is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.19 on Frozen Soils and Rock.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.